

Translation of the original instructions





euroLINE 32 KLA

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MAN_EN_1081004_euroLINE32-KLA_R3b.doc	2015-03-04	Slide variant 2, 3 and 5 with brake are no longer available (see chapter 3.3.1  12, 6.3.2  31, 6.3.3  32, 6.3.5  34)

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1 Safety

1.1 Definition of Warning Notes



WARNING

Indicates potential danger. Non-observance of the safety provisions may cause death or severe injury.



CAUTION

Indicates potential danger. Non-observance of the safety provisions may cause property damage or injury.

NOTE

Offers additional information.

1.2 General Warning Notes

The linear unit euroLINE 32 KLA must only be commissioned by specialists who received safety-technical instruction and are able to assess potential dangers. Furthermore, all chapters of these operating instructions must have been read and understood completely.



WARNING

The system must be powered down for all assembly, disassembly or repair work. There is a high danger of injury.



CAUTION

Motor connectors must not be inserted or disconnected when live. Risk of burning of the contacts and risk of flying sparks.



CAUTION

Linear modules always have to be operated in connection with suitable safety devices (e.g. safety cell, protective room, protective housing, light curtain).



WARNING OF HOT SURFACE

During operation, heating of the motor, in particular of stepper motors, can cause the burns of the skin when touching the motor. Install a protective device, if possible! Do not touch the marked areas or wait for an adequate cooling time.

NOTE

Observe the Declaration of Incorporation (see section *Declaration of Incorporation*, page 40).

1.3 Special Hazard Warnings

In addition, this operating instructions also contains the following special hazard warning:



DANGER FROM CRUSHING AND SHEARING

These places of the components pose the danger of crushing and shearing limbs in operation.

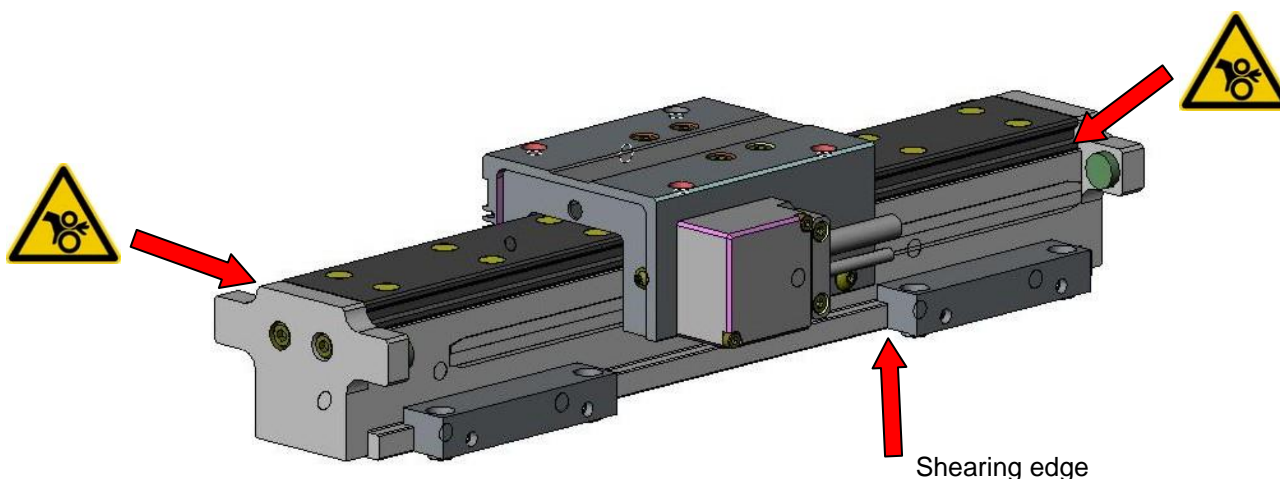


Figure 1: Risks of crushing and shearing on the euroLINE 32 KLA



CAUTION OF MAGNETIC FIELD

The basic body of the linear motors contains strong permanent magnets that could damage magnetic data media (e.g. disks or credit cards).



CAUTION OF MAGNETIC FIELD

The euroLINE unit may not be used in an environment containing magnetic dusts or small parts!

2 Intended Use

The linear unit euroLINE 32 KLA (see *Figure 2*) is a precise, straight-line adjustment unit with ironless linear motor that is used as an attachment part in connection with other components in industrial applications. In combination with a variety of standardized assembly elements as well as the other linear units from IEF Werner, it is also possible to set up complex, multi-axis positioning systems.

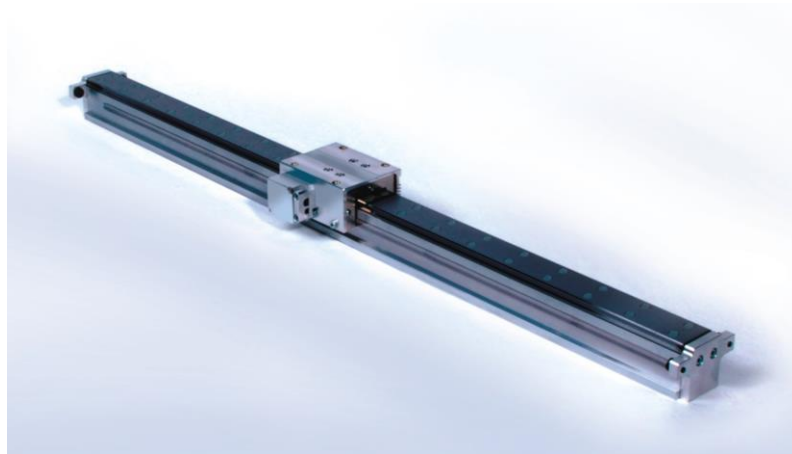


Figure 2: Linear unit euroLINE 32 KLA

Areas of Application

- Component insertion systems
- Handling of small parts
- Loading and unloading stations
- Measuring and test technology
- etc.

2.1 Reasonably Foreseeable Misuse

The euroLINE 32 KLA adjustment unit is **not** to be used for deviating applications, in particular for the transport of persons and animals. The use as a pressing/bending device for cold working of metal is not allowed.

The use of the linear module without additional measures is **not** possible in the chemical or food industry or in explosive atmospheres.

In case of doubt, consult the manufacturer.

3 Assembly Instructions

3.1 Installation Position

The TG 1001250 subassembly is intended for horizontal application of the euroLINE 32 KLA. The TG 1001255 subassembly is used for vertical application of the euroLINE 32 KLA. In case of vertical application, the linear drive units are equipped with a pneumatic weight compensation cylinder and the slide versions with a pneumatically actuated spring-operated brake (see section *Connection for the Options, from page 21 onwards*).



CAUTION

For vertical installation, the linear drive units must be provided with a pneumatic weight compensation cylinder and the slide version with a pneumatically operated spring-operated brake (see *Figure 3, below* and *Figure 22, page 29*).

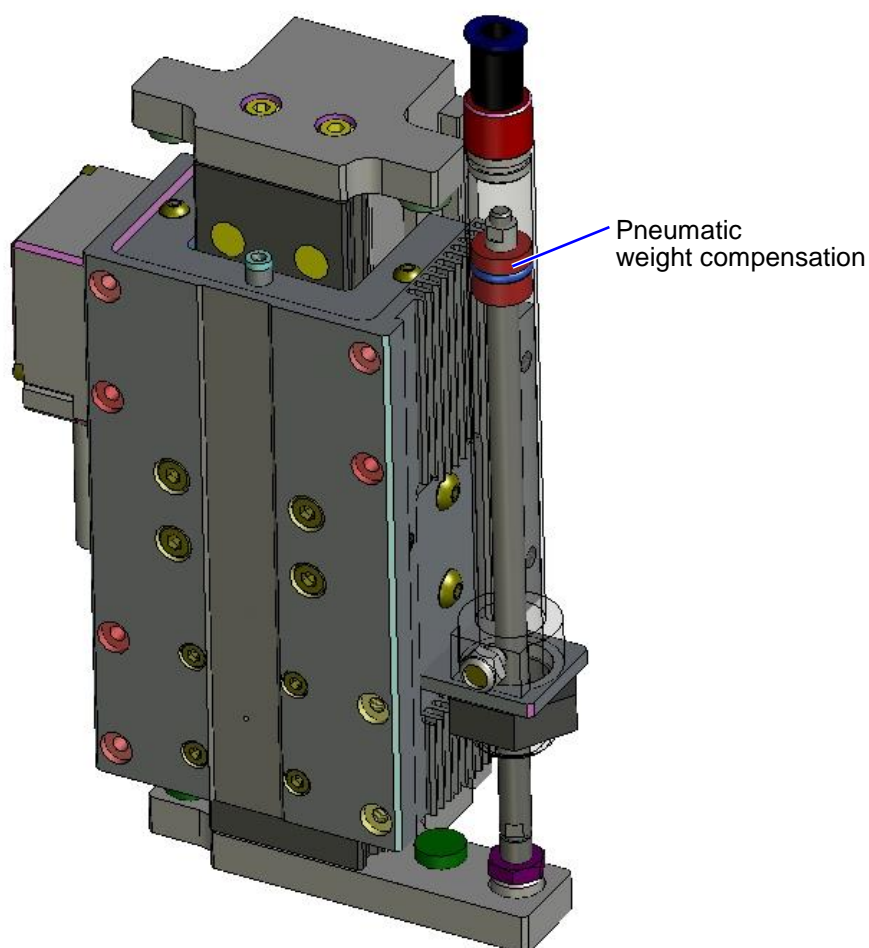


Figure 3: euroLINE 32 KLA, vertical application (TG1001255)

3.2 Transverse Mounting

Standard mounting material (clamping element, centering sleeve, mounting bracket) is available for transverse mounting of the euroLINE 32 KLA linear drive units.

A variety of axis combinations is possible.

Examples:

- XZ-system
- XY-system
- XYZ-system
- 2 * XYZ-system (portal)
- etc.

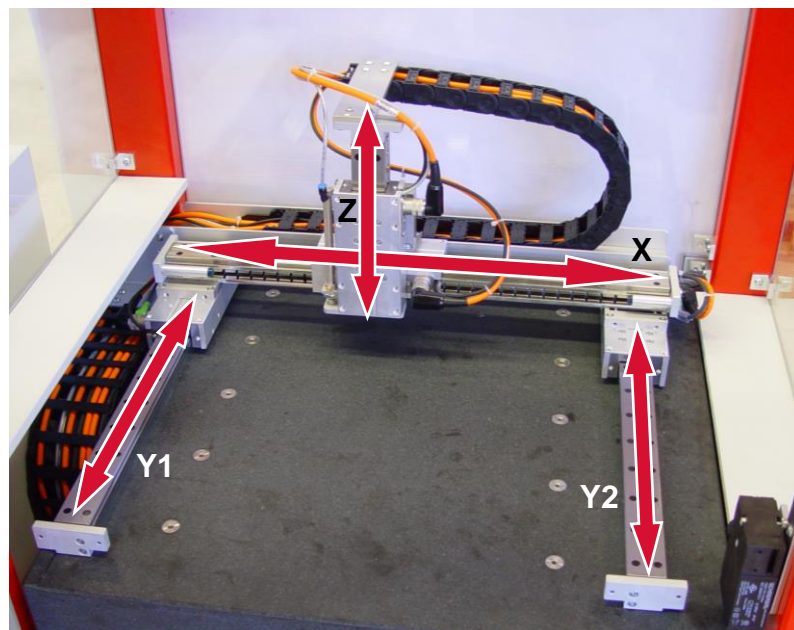


Figure 4: XYZ-System (Portal)

NOTE

The dimensional drawings for the mounting accessories (centering sleeve, clamping elements, mounting bracket) are to be found in section *Accessory Drawings*, from page 38 onwards.

3.3 Attachment

The attachment of the euroLINE 32 KLA can be performed on the basic body by means of clamping elements (see *Figure 5*) or on the slide (see *Figure 6*, page 12 to *Figure 9*, page 13) via threaded holes.

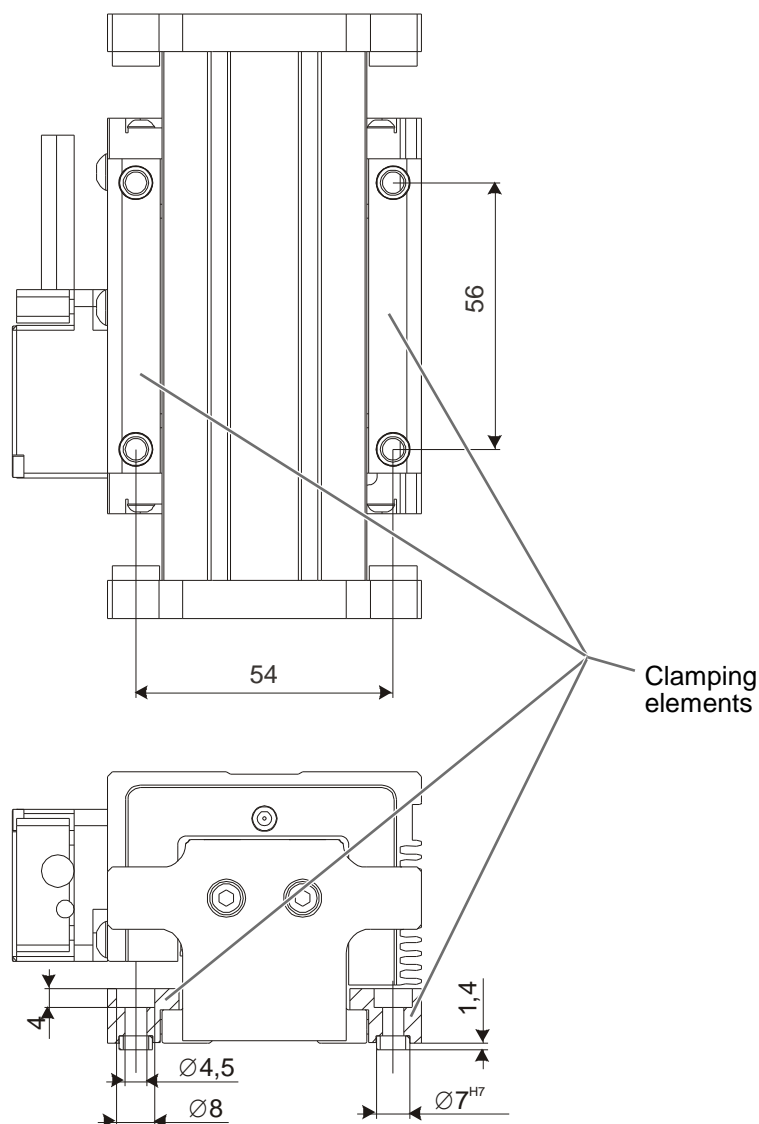


Figure 5: Attachment on Basic Body by means of Clamping Elements

NOTE The installation area has to be a flat surface.
Any deviations from an ideal flat plane directly affect the processing precision.

NOTE Attachments on slide, see *Figure 6*, page 12 to *Figure 9*, page 13.

3.3.1 Installation of Actuators

The actuators (cylinders, pick-up modules, etc.) that are to be installed on the euroLINE 32 KLA linear drive unit can be attached via the drilling pattern on the slide.

Appropriate drilling patterns are available for the four possible slide sizes.

The placement tolerance of centering drillings 7^{H7} is ± 0.01 mm.

NOTE The depth of the threaded holes (8 mm) must be observed!

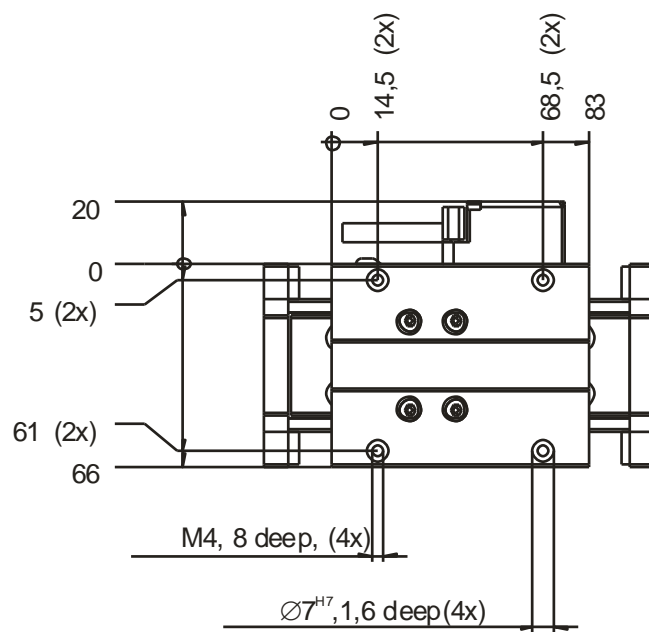
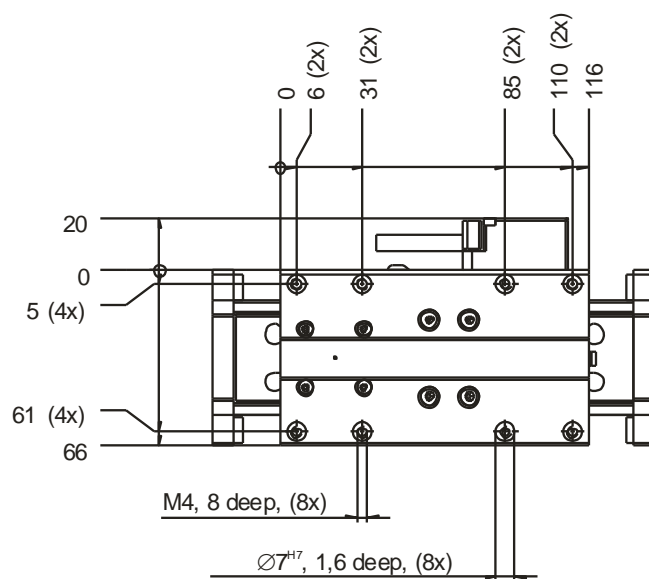


Figure 6: Slide variant 1; Slide Length $l = 83$ mm



**Figure 7: Slide variant 2; Slide Length $l = 116$ mm
(this slide variant is no longer available)**

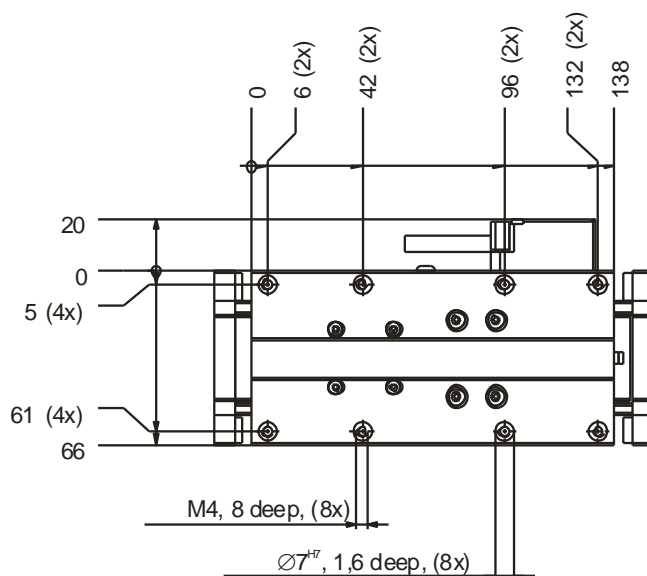


Figure 8: Slide variant 3-4; Slide Length l = 138 mm
(the slide variant 3 is no longer available)

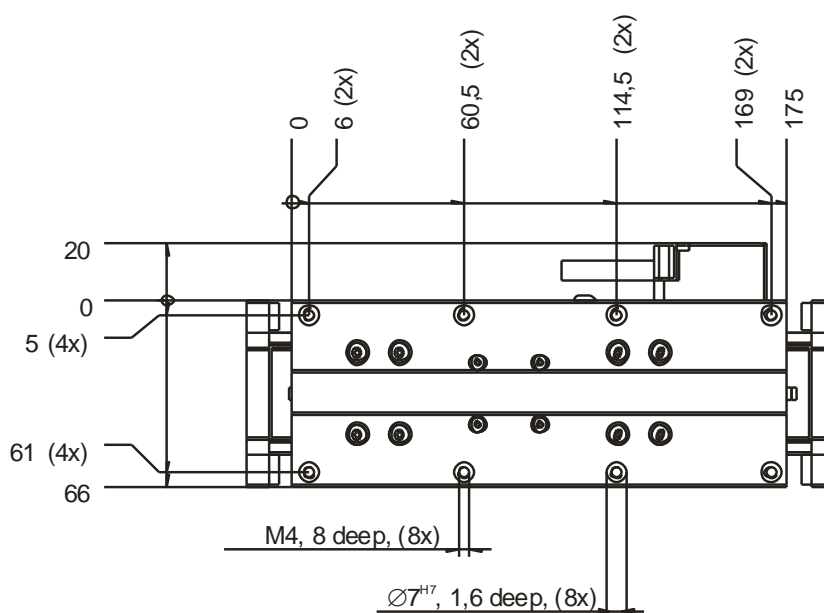


Figure 9: Slide variant 5; Slide Length l = 175 mm
(this slide variant is no longer available)

NOTE The slide versions 2, 3 and 5 with brake are no longer available.

3.4 Wiring

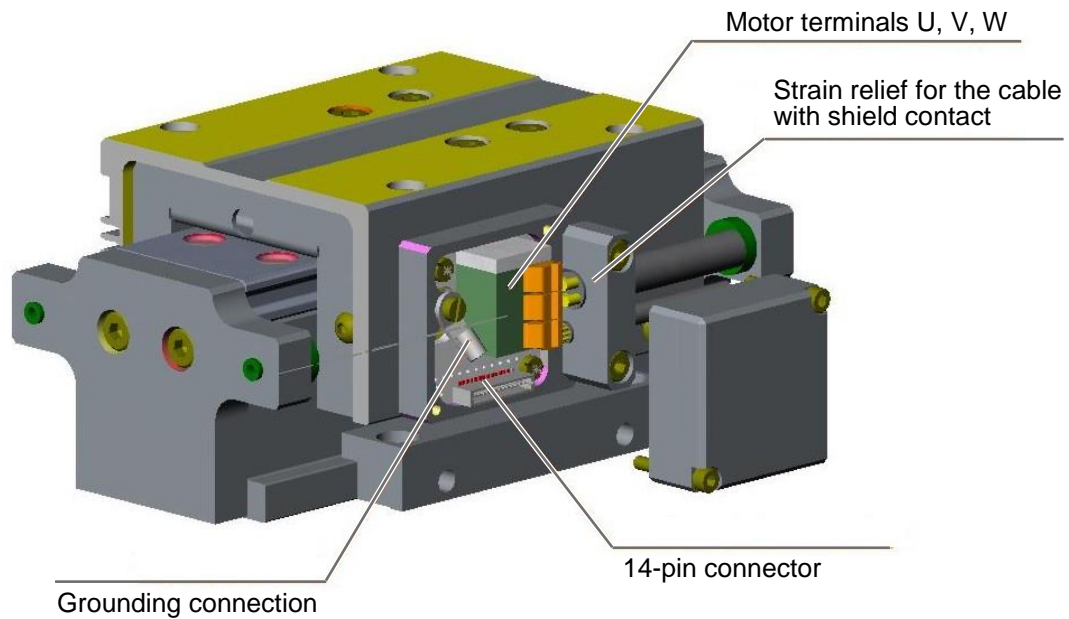


Figure 10: Terminal Box for Motor, Sensor, Hall Connection

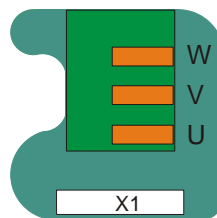


Figure 11: Motor Connection

3.4.1 Motor

On the euroLINE 32 KLA, the motor is connected via 3 terminals that are located on a board in the terminal box. The wires of the motor coil are connected to the terminals U, V and W. The ground wire is directly connected with the base plate of the terminal box by means of a cable lug. During final assembly, it must be observed that the load on the motor cable is correctly relieved by the strain relief.

3.4.2 Encoder, Hall Sensor, Temperature Signal

A 14-pin connector is available on the board in the terminal box. The data of the optical encoder system, the Hall sensor as well as the motor temperature control are transferred via this 14-pin connector. The optical encoder system is an RS422/TTL interface.

Assignment of 14-pin connector [X1]

Optical encoder system type 20									Hall-Sensor			Motor	
Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 12	Pin 9	Pin 10	Pin 11	Pin 13	Pin 14
0 V	+5V	Z1 +	Z1 -	Z2 -	Z2 +	Z0 -	Z0 +	NAS	U	V	W	Temp +	Temp -

The NAS signal provides information on the signal quality of the optical measuring system.

- **NAS** = negated monitoring signal
 - System ok → NAS signal high
 - System not ok → NAS signal low

3.4.2.1 Characteristics PTC Temperature Sensor Type KTY84/151 (Standard)

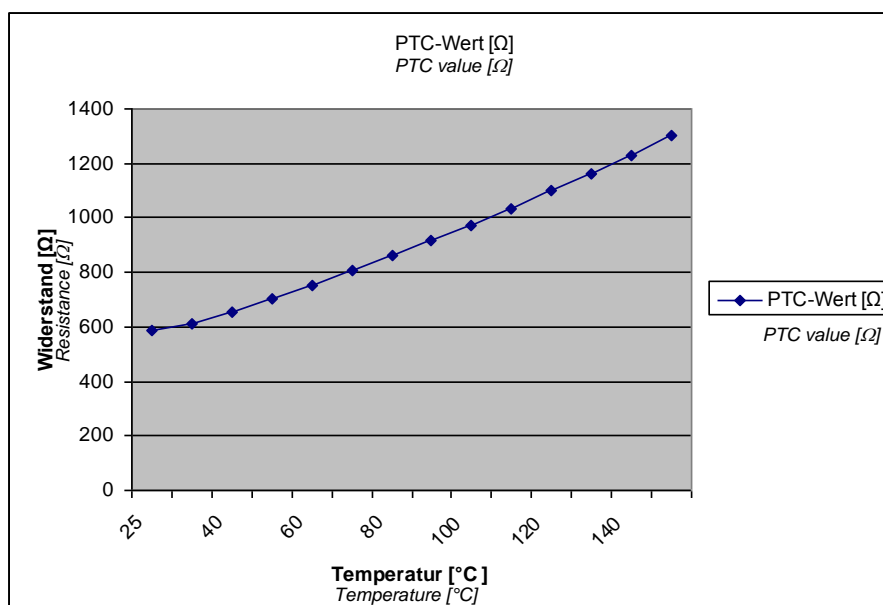


Figure 12: Characteristics PTC Temperature Sensor

The usage of a PTC temperature sensor is labelled/documentated on the type plate with „euroLINE 32 KLA **PTC**“ oder „euroLINE 32 KLAZ **PTC**“.

3.4.2.2 Characteristics NTC Temperature Sensor (Optional)

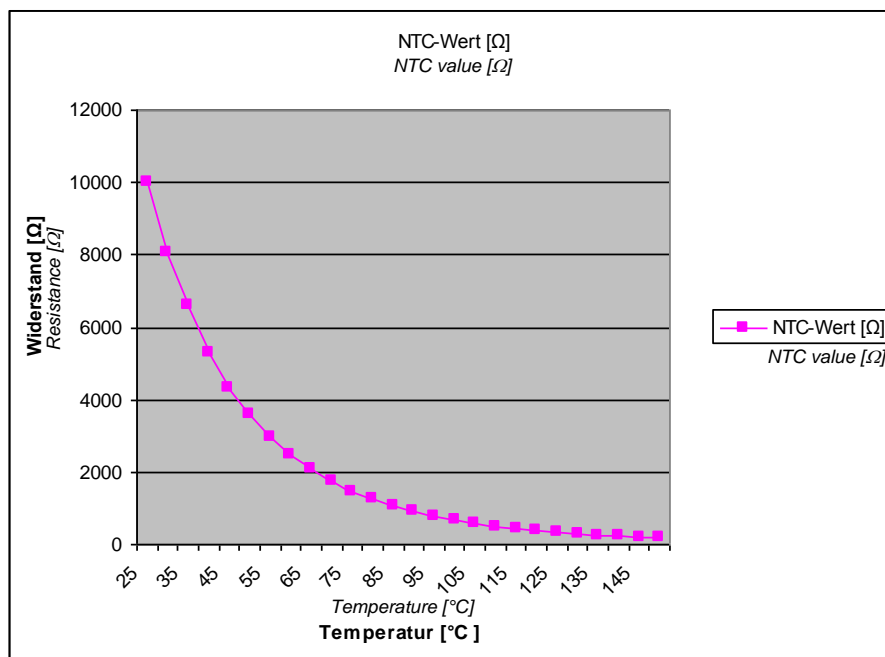


Figure 13: Characteristics NTC Temperature Sensor

The usage of an NTC temperature sensor is labelled/documentated on the type plate with „euroLINE 32 KLA **NTC**“ oder „euroLINE 32 KLAZ **NTC**“.

3.4.2.3 Installation Situation Measuring System

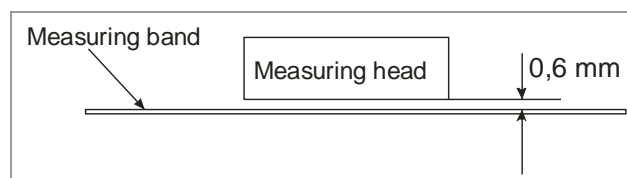


Figure 14: Spacing of the Measuring Band ↔ Head

3.4.2.4 Shield Concept: Optical Encoder System Type 20

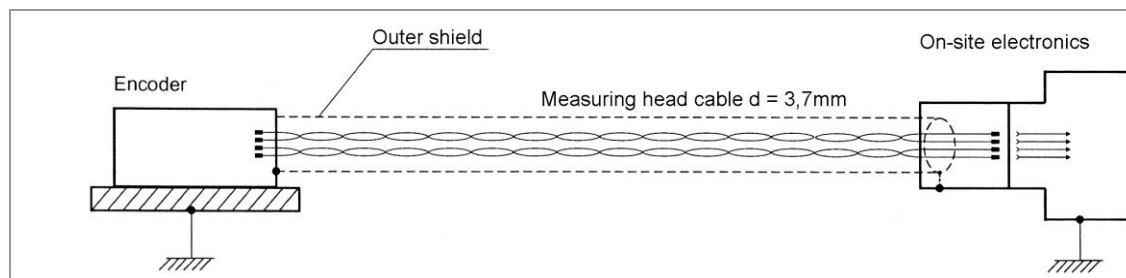


Figure 15: Shield Concept of the Optical Encoder System Type 20

3.4.3 Cable Routing

For all moving cables, suitable cable routing has to be used to effectively prevent cable breaks. The minimum radius r_{\min} for cable routing chains is calculated for IEF cables according to the following formula:

$$r_{\min} \geq 10 \times \text{cable diameter}$$

When other cables are used, EN 60204 must be observed. In addition, it must be ensured that a space reserve of 30% is kept free within the routing chains. A strain relief for the cables has to be attached at the outlet of the cable routing chain.

We recommend to procure original cables and cable routing chains from IEF Werner. Please contact us, we will be pleased to provide advice.

3.5 Technical Data

3.5.1 Tightening Torques for Screw Connections [Nm]

Property class	M2,5	M3	M4	M5	M6	M8
8.8	0,5	1,28	2,7	5,5	9,5	23
10.9	0,8	1,8	3,8	8	13	32
12.9	1,0	2,1	4,6	9,5	16	39


3.5.2 Technical Data of the Linear Unit euroLINE 32 KLA

		Slide type (slide length)			
Designation	Unit	Type 83	Type 116	Type 138	Type 175
Slide length	[mm]	83	116	138	175
Width of basic body	[mm]	43			
Stroke in 40 mm grid (depending on slide type)	[mm]	7 ... to ... 2007 (longer strokes on request)			
Continuous feed force	[N]	22		44	
Maximum speed	[m/s]	4,8			
Maximum acceleration	[m/s²]	70			
Basic weight carriage body l = 111 mm	[g]	685			
Weight per 40 mm extra length	[g]	233			
Maximum handling weight	[g]	2000		4000	
Linearity measuring system	[µm]	± 5			
Repetition accuracy	[µm]	± 3			
Temperature range	[° C]	0 to + 50			
Coil type		S1		S2	
Coil length	[mm]	60,96		121,92	
Force constant	[N/A]	8,9		17,79	
Continuous current	[A]	2,5			
Peak current for 1s (S2 mode, VDE 0530 and IEC)	[A]	7,5			
Permanent force	[N]	22		44	
Peak force	[N]	66*		132*	
Maximum DC intermediate circuit voltage	[V/DC]	380		380	
Phase resistance at 25 °C (U,V,W)	[Ω]	6,0		12	
Phase resistance at 125 °C (U,V,W)	[Ω]	10,1		20,2	
Inductance at 1 kHz	[mH]	1,98		3,96	
Anti EMK	[V/mps]	18,11		36,22	
Pole distance (north pole – north pole)	[mm]	30,48		30,48	
Coil maximum operating temperature	[° C]	110		110	

* for 1s (S2 mode, VDE 0530 and IEC)

3.5.3 Type Plate

IEF Werner GmbH
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Telefon (0 77 23) 925-0
Service@IEF-Werner.de



euroLINE
32KLA-PTC-0-S1-1µm

V-Nr. 2217587
Ser.Nr. 66789

U = 380 VDC
I_n = 2,5 A
I_{max} = 7,5 A

Resolution measuring System
Auflösung Messsystem 1µm (0.1µm, 5µm)

Coil type
Spulentype : S1, S2

Brake 0=no, 1=yes
Bremse : 0=nein, 1=ja

Temperature sensor
Temperatursensor : PTC, NTC


Aluminium construction
Aluminium Ausführung

Linear motor
Linearmotor

Ball bearing guide
Kugelumlauführung

Installation size 32
Baugröße 32

IEF Werner GmbH
Wendelhofstraße 6
D-78120 Furtwangen
Telefon (0 77 23) 925-0
Service@IEF-Werner.de



euroLINE
32KLA-PTC-0-S1-1µm

V-Nr. 2217587
Ser.Nr. 66789

U = 380 VDC
I_n = 2,5 A
I_{max} = 7,5 A

Maximum DC intermediate circuit voltage
max. DC-Zwischenkreisspannung

Nominal current
Nennstrom

Peak current
Spitzenstrom

Order number
Auftragsnummer

Serial number
Seriennummer

Figure 16: Explanation Type Plate

3.5.4 Permissible Moments, Carrying Capacity, Weight and Configuration

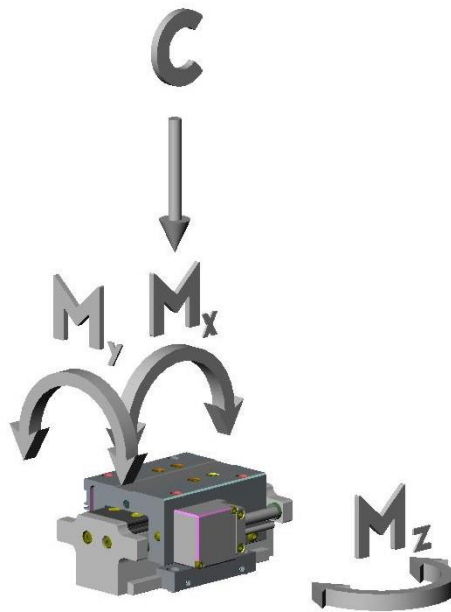


Figure 17: euroLINE 32 KLA

Type		Configuration			Permissible moments						
Designation	Slide length [mm]	No. of carriages	Hall Sensor	Brake	M _x [Nm]	M _y [Nm]	M _z [Nm]	Feed Force [N]	Weight of Carriage [g]	Coil Type	Continuous Current [A]
83	83	1			10	10	10	22	411	S1	2,5
116H	116	1	X		10	10	10	22	524	S1	2,5
116B	116	1		X	10	10	10	22	551	S1	2,5
116 HB	116	1	X	X	10	10	10	22	592	S1	2,5
138	138	1			10	10	10	44	582	S2	2,5
138 B	138	1		X	10	10	10	44	647	S2	2,5
138	138	2			50	20	20	44	817	S2	2,5
175 H	175	2	X		50	20	20	44	846	S2	2,5
175 B	175	2		X	50	20	20	44	879	S2	2,5
175 HB	175	2	X	X	50	20	20	44	914	S2	2,5

H = Hall sensor; B = Brake

3.6 Connection for the Options

3.6.1 Pneumatic Support

The pneumatic support for vertical applications serves for the load balancing. The user sets the pressure to the appropriate load with the help of the pressure control valve. The pressure is set correctly when the carriage stays in its respective position.

Requirements:

- Brake not activated
- Motor not in control

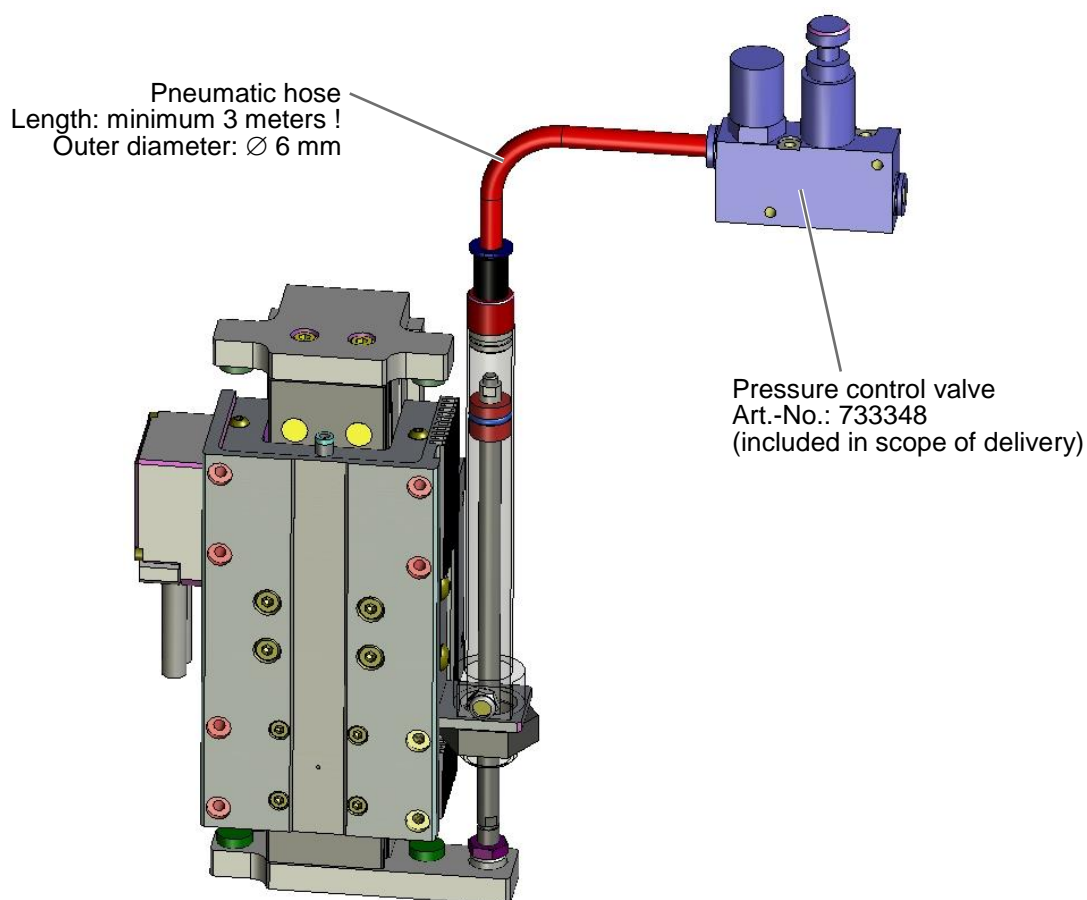


Abbildung 18: Pneumatic Support

3.6.2 Brake

The brake for vertical applications prevents a dropping of the drive. The holding power of the brake is 25 N. The brake is operated by the solenoid valve Art.-No.: 1040381. For the operation of the brake, compressed air (6 bar) is necessary.

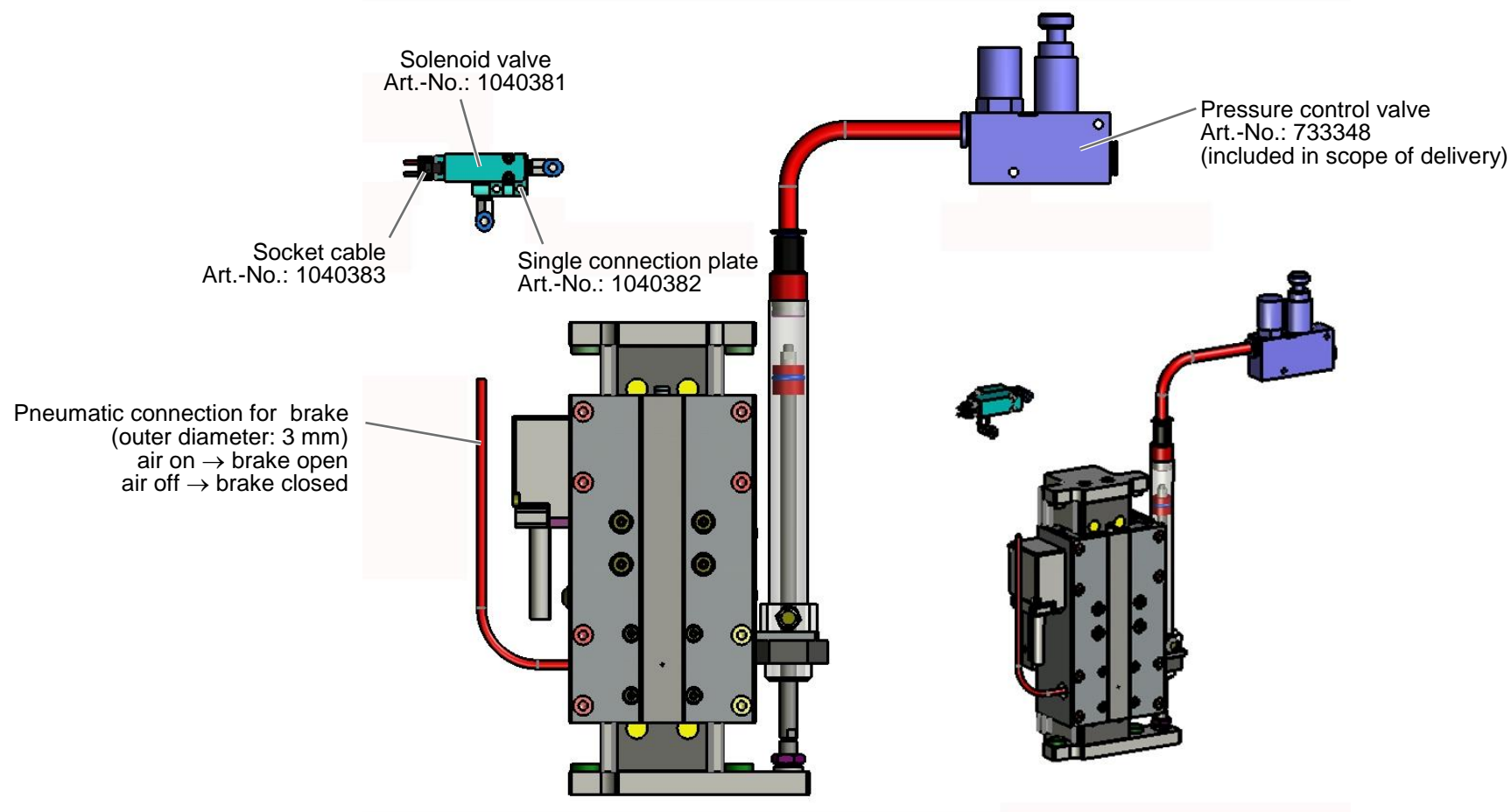


Figure 19: Brake

4 Maintenance



CAUTION

Repairs have to be generally performed by specialist personnel who have read and understood the operating instructions.
Only when original parts are used can warranty claims be accepted by IEF Werner GmbH.



CAUTION

Always **de-energize** the system before beginning the repair.

4.1.1 Maintenance of the Optical Measuring System



CAUTION

Modifications and repairs of this measuring system may be performed only by the manufacturer or by persons authorized by the manufacturer.
The manufacturer will not be liable for damage resulting from unauthorized manipulation of the measuring system. All warranty claims become void by unauthorized manipulations.

NOTE The measuring system is maintenance-free.

However:

Open measuring systems are sensitive to soiling and therefore have to be protected by the user against the effects of dirt by design measures.

This applies in particular for the protection of the measuring band divisions (measuring band surface) and the side of the measuring head facing the measuring band (sensor window).

Coarse and uneven soiling and deposits (e.g. oil, grease or water) are especially critical. Depending on the installation position and the ambient conditions, occasional cleaning of the measuring band surface or of the sensor window can be required. When using the monitoring signal that is output by the measuring head, the necessity for cleaning is indicated.

NOTE When the assemblies are cleaned, it must be observed that deposited particles can scratch the sensor and the scale.

Rough soiling must be cleaned with a soft brush. Cotton wool or a soft cloth and acetone or denaturated alcohol are suitable for fine cleaning.

4.2 Guide Lubrication

The guide slides have received a longtime lubrication in the factory for an operating performance of 10,000 km. To achieve a higher operating performance, we recommend to regularly relubricate the guide. Relubrication is performed with AFF lubricant via a grease nipple that is mounted on the slide with a hand-held grease gun (IEF Werner Art.-No.: 1072729). See *Figure 20*.

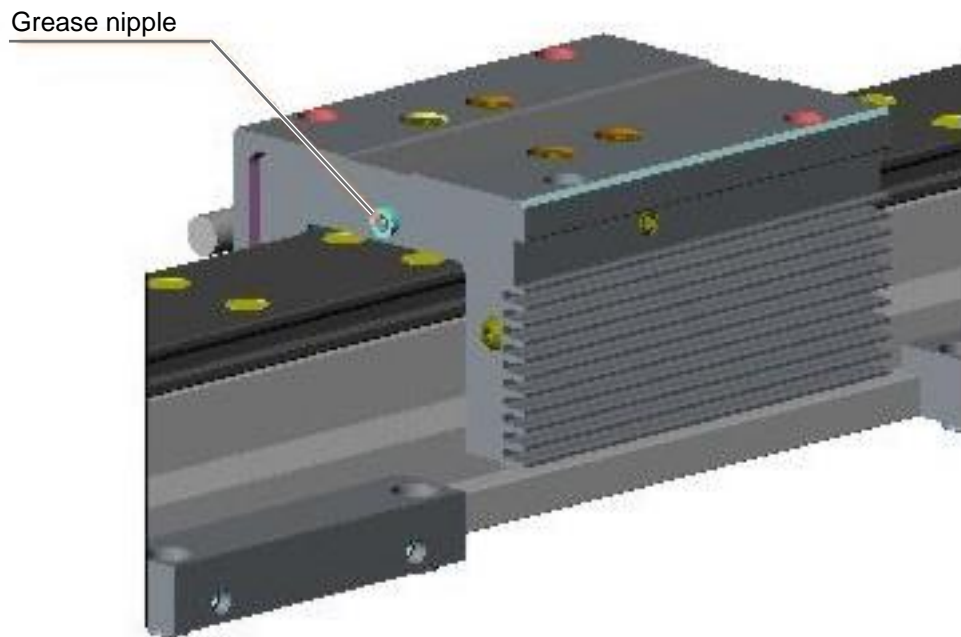


Figure 20: Lubrication of the guide slide

The recommended maintenance intervals are approx. 500 operating hours in normal ambient conditions. The maintenance intervals should be reduced for unfavorable ambient conditions (large amounts of dust, high humidity, high temperature, high operating performance).

5 Troubleshooting

Interference	Reason	Correction
Increased running noise	Nominal service life of guide carriages exceeded	Complete exchange of guide carriages
	Torque load on guide carriages too high, therefore play in the guide carriage	Complete exchange of guide carriages
	Motor coil does not run "free" and scrapes	Exchange the complete slide unit
	Error in power electronics or control unit	Check and exchange power electronics or control unit, if necessary
Linear unit does not move	Blockage by magnetic foreign parts in the area of the magnets	Remove foreign parts, check motor coil for damage
	Motor coil does not run "free" and blocks	Exchange the complete slide unit
	Clamp connection of motor cable in terminal box loose	Reconnect clamp U,V,W Caution: Only in de-energized condition
	14-pin connector in terminal box loose	Reconnect Caution: Only in de-energized condition
	Sensor cable defective	Replace sensor cable
	Measuring system defective	<ul style="list-style-type: none"> • Check distance measuring head ↔ measuring band, nominal spacing = 0.6 mm • Replace complete slide, if required
	Motor coil defective	Exchange the complete slide unit
	Hall sensor defective	Exchange the complete slide unit
	Guide carriage defective (binding, blockage)	Exchange of guide carriages and the guide rail, if required
	Brake module defective (for vertical applications)	Exchange brake module
	No pressure or incorrect pressure applied to the weight compensation cylinder	Check pneumatic pressure
	Weight compensation cylinder defective	Exchange weight compensation cylinder
Loss of position	Error in power electronics or control unit	Check components and exchange, if necessary
	Measuring system defective	<ul style="list-style-type: none"> • Check distance measuring head ↔ measuring band, nominal spacing = 0.6 mm • Replace complete slide, if required
	Measuring band soiled, damaged	Clean measuring band, replace, if required

6 Parts Lists and Drawings

6.1 euroLINE 32 KLA, Parts List TG1001250

Drawing Pos.	Art.-No.:	Part (1) / Assembly (0)	Designation	Wearing part = V Replacement part = E
10	1001252	0	Basic body 32 KLA, complete	E
20	1001138	0	Rail guide	V
30	626710	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 8	
40	1057416	1	Protection cap for guide rail	
50	626483	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 10	
60	1001144	0	Measuring band	E
70	1068982	1	End plate	
80	26481	1	Damper, green, PUR 80 Shore	
90	626483	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 10	
100	1001247	0	Slide, complete	E,V

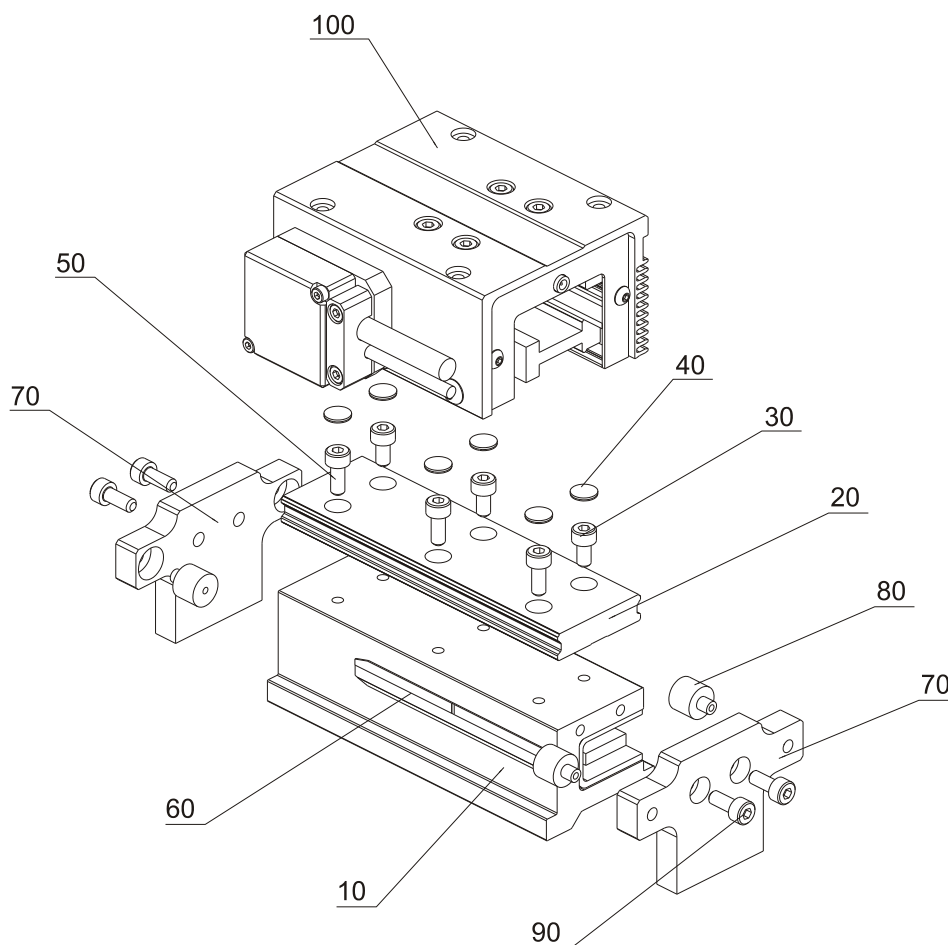


Figure 21: Exploded view TG1001250

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6.2 euroLINE 32 KLA Vertical Axis, Parts List TG1001255

Drawing Pos.	Art.-No.:	Part (1) / Assembly (0)	Designation	Wearing part = V Replacement part = E
10	1001252	0	Basic body AL, complete	
20	1001138	0	Rail guide	V
30	626710	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 8	
40	1057416	1	Protection cap for guide rail	
50	626483	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 10	
60	1001144	0	Measuring band	E
70	1068982	1	End plate	
80	1069062	1	End plate	
90	26481	1	Damper, green, PUR 80 Shore	
100	626483	1	Fillister head screw, galvanized, DIN 912 Type: M4 x 10	
110	1001247	0	Slide, complete	E,V
120	1069129	1	Weight compensation cylinder, stroke=80 mm	V
	1069130	1	Weight compensation cylinder, stroke=125 mm	
	1069131	1	Weight compensation cylinder, stroke=160 mm	
	1069132	1	Weight compensation cylinder, stroke=200 mm	
130	733348	1	Pressure control valve (for pressure control) LRMA-QS-6	E
140	1040381	1	Solenoid valve (for brake) MHA1-M1H-3/2G-0,6-HV	E
150	1040382	1	Single connection plate, Type: MHA1-AS-3-M3	E
160	1040383	1	Socket cable, Type: KMH-0,5	E

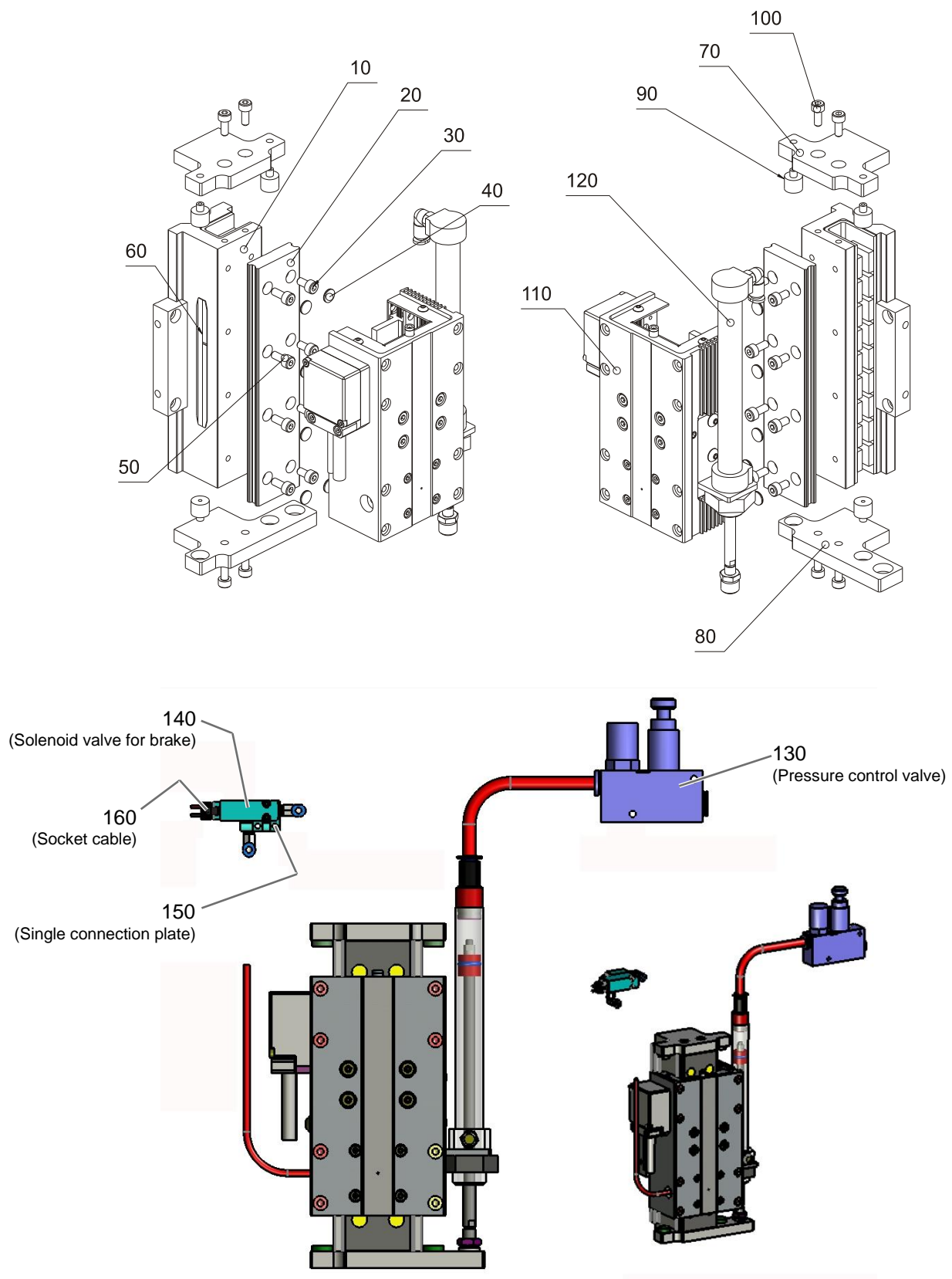


Figure 22: euroLINE 32 KLA, Z-axis

6.3.2 Mounting Version 2 (the slide variant 2 with brake is no longer available)

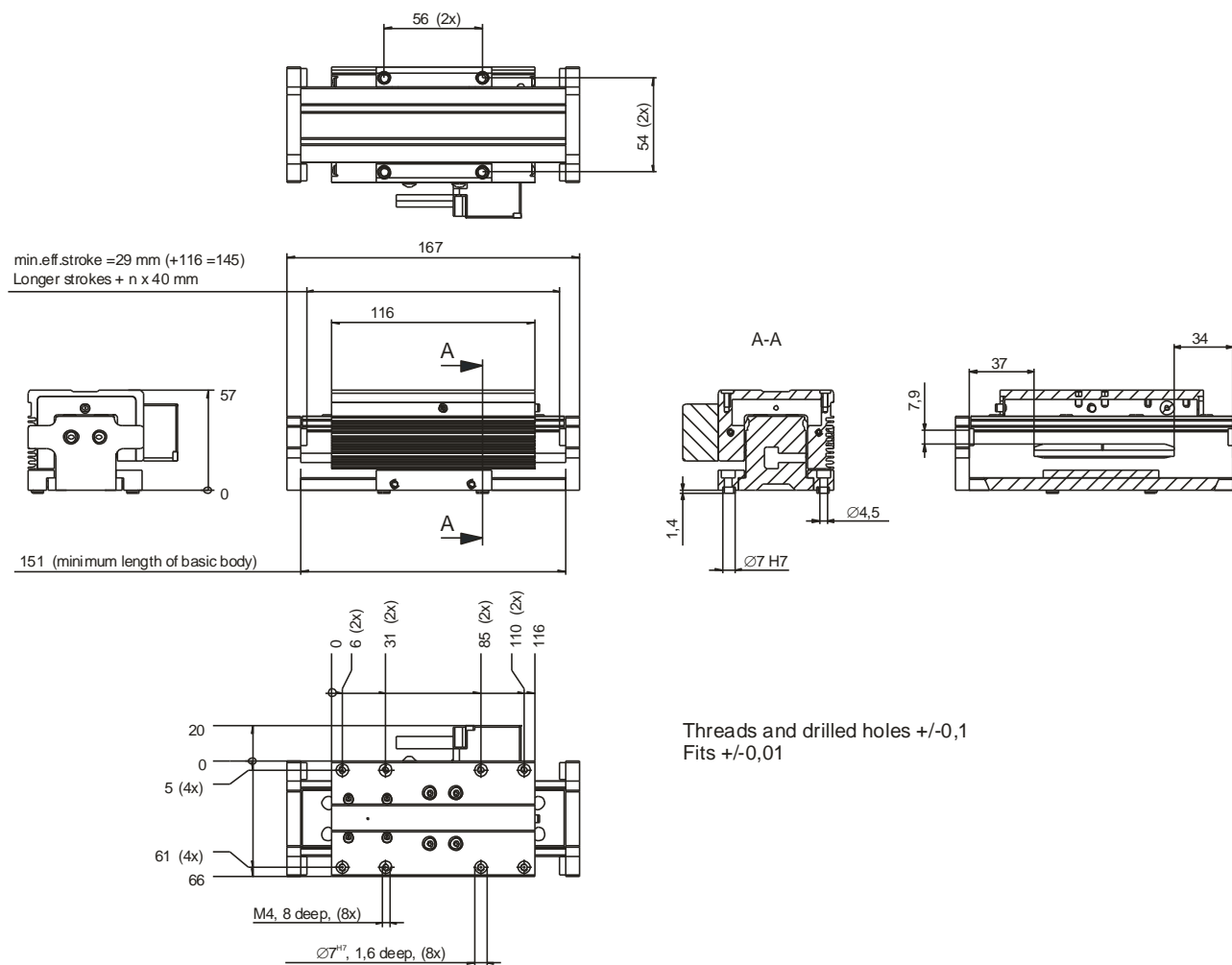


Figure 24: euroLINE 32 KLA, Version 2

6.3.3 Mounting Version 3 (the slide variant 3 with brake is no longer available)

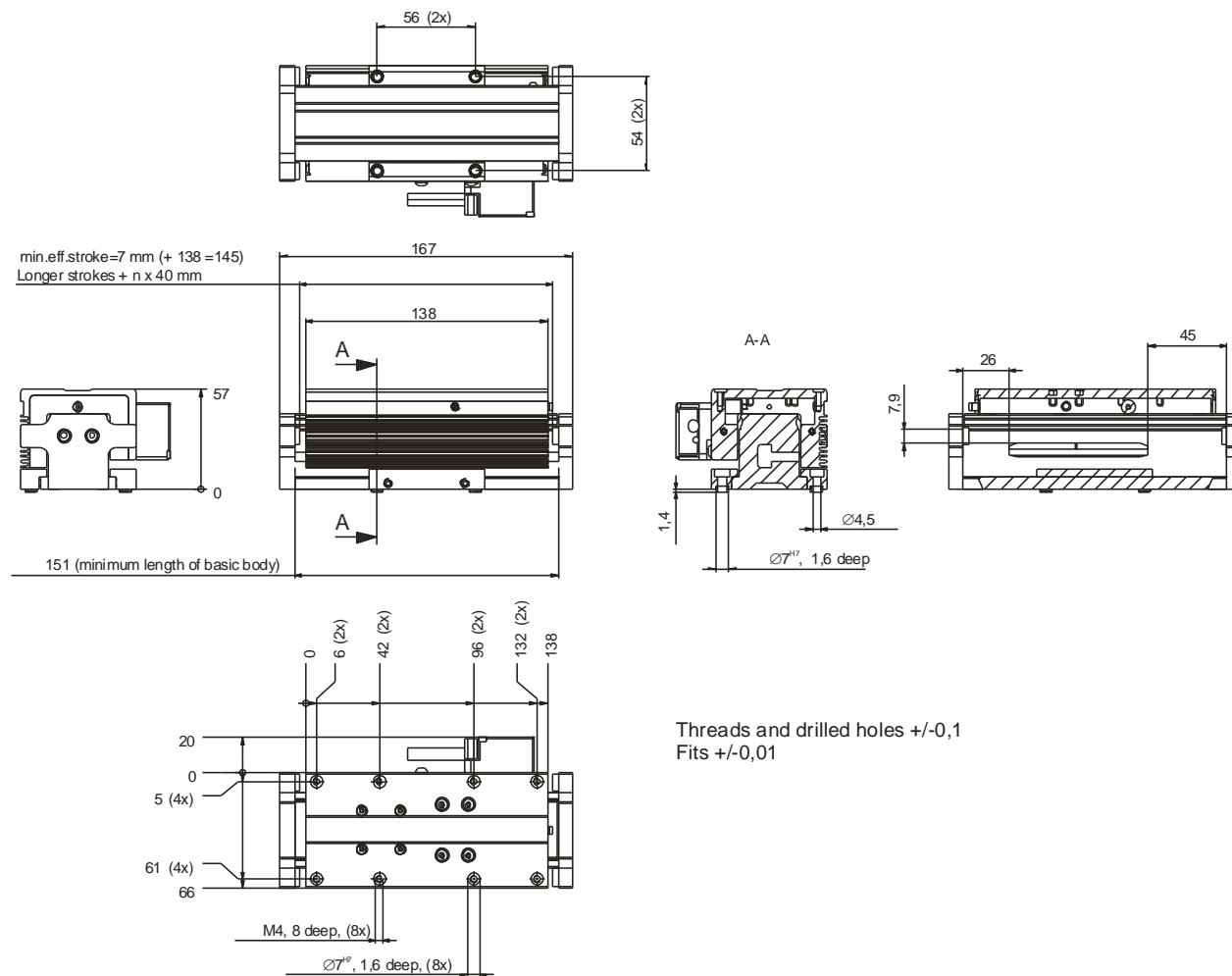


Figure 25: euroLINE 32 KLA, Version 3

6.3.4 Mounting Version 4

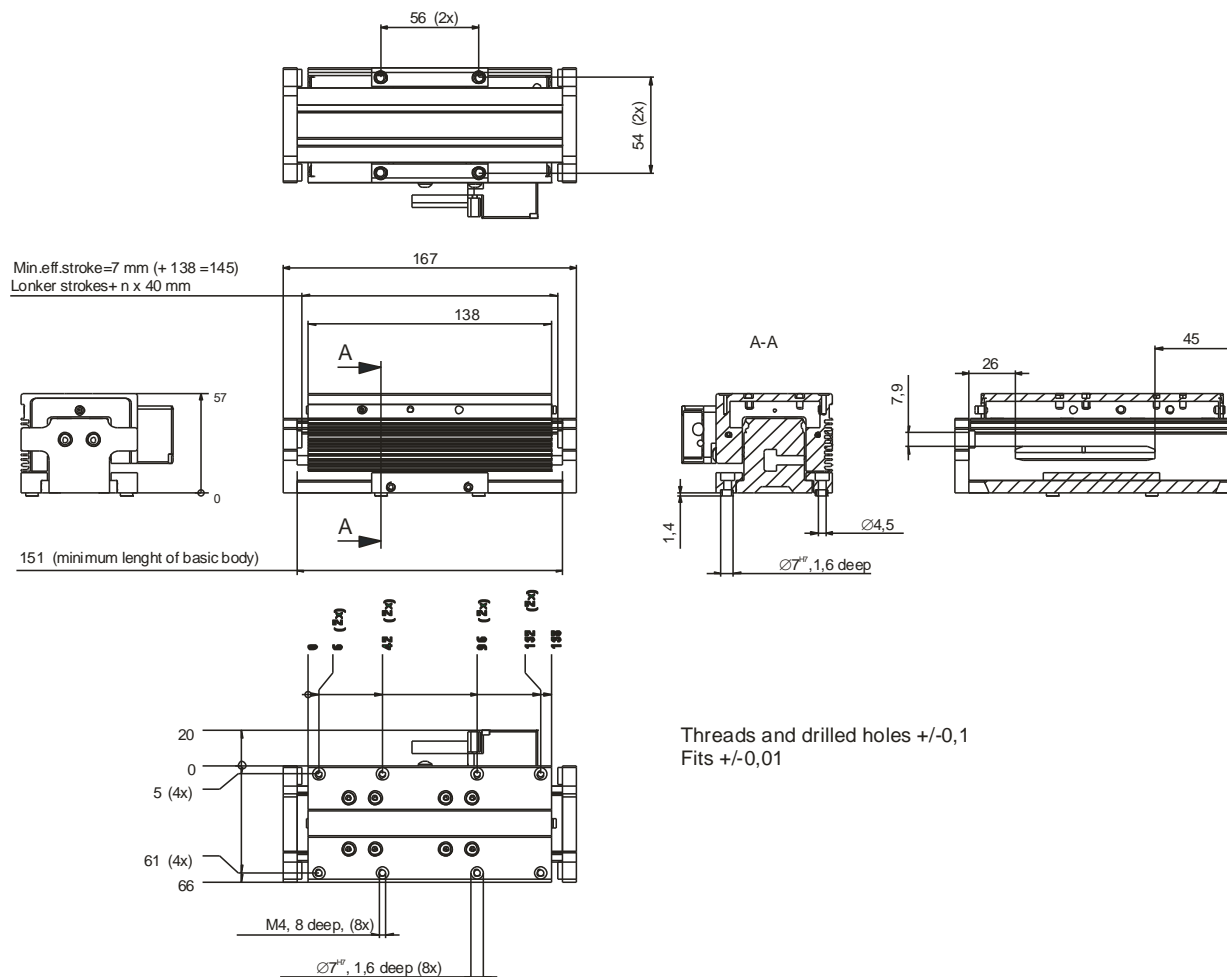


Figure 26: euroLINE 32 KLA, Version 4

6.4 Dimensional Drawing for Z-Axis euroLINE KLA Versions 2, 3 and 5

6.4.1 Z-axis, Mounting Version 2

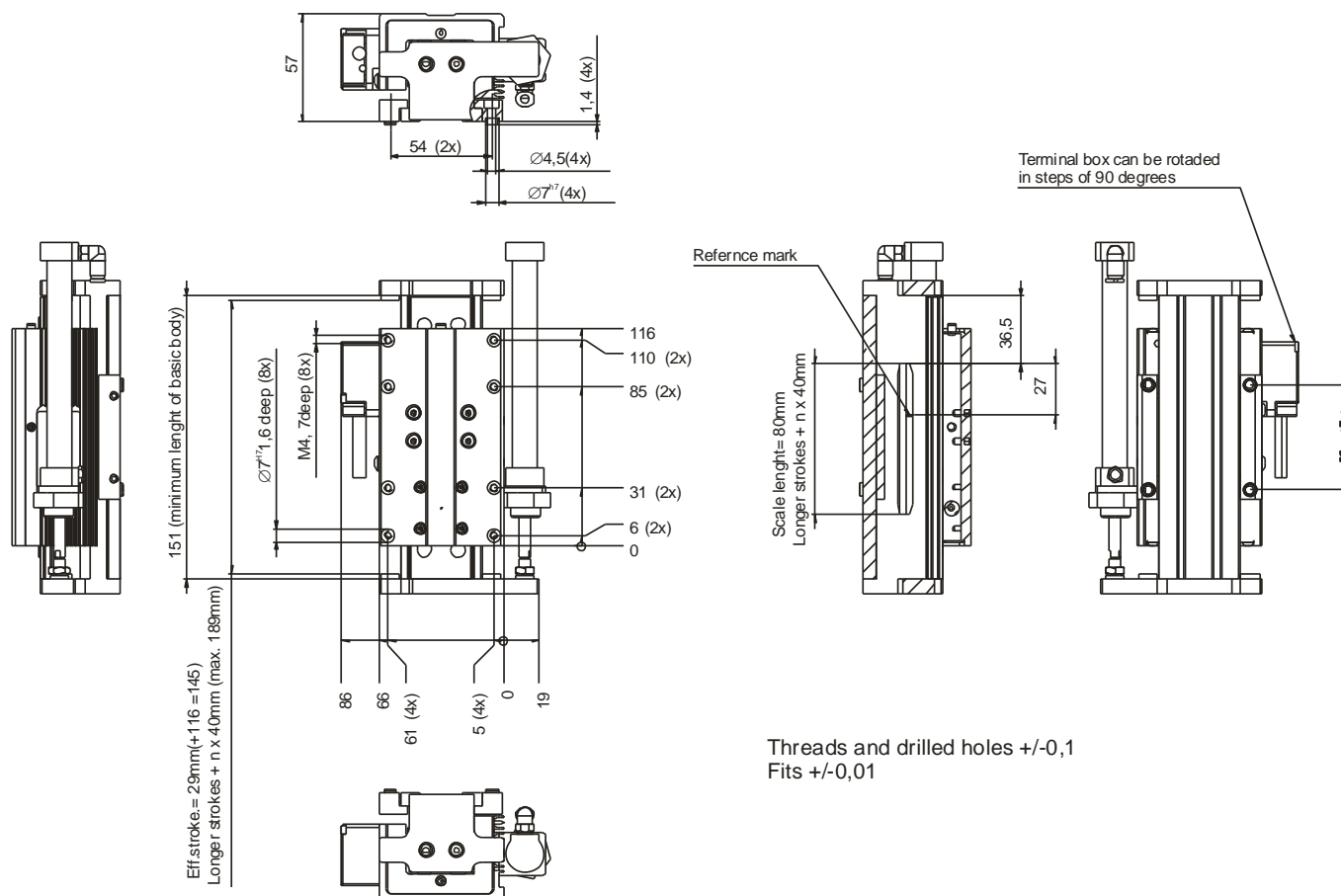


Figure 28: euroLINE 32 KLA Z-axis, Version 2

6.4.3 Z-axis, Mounting Version 5

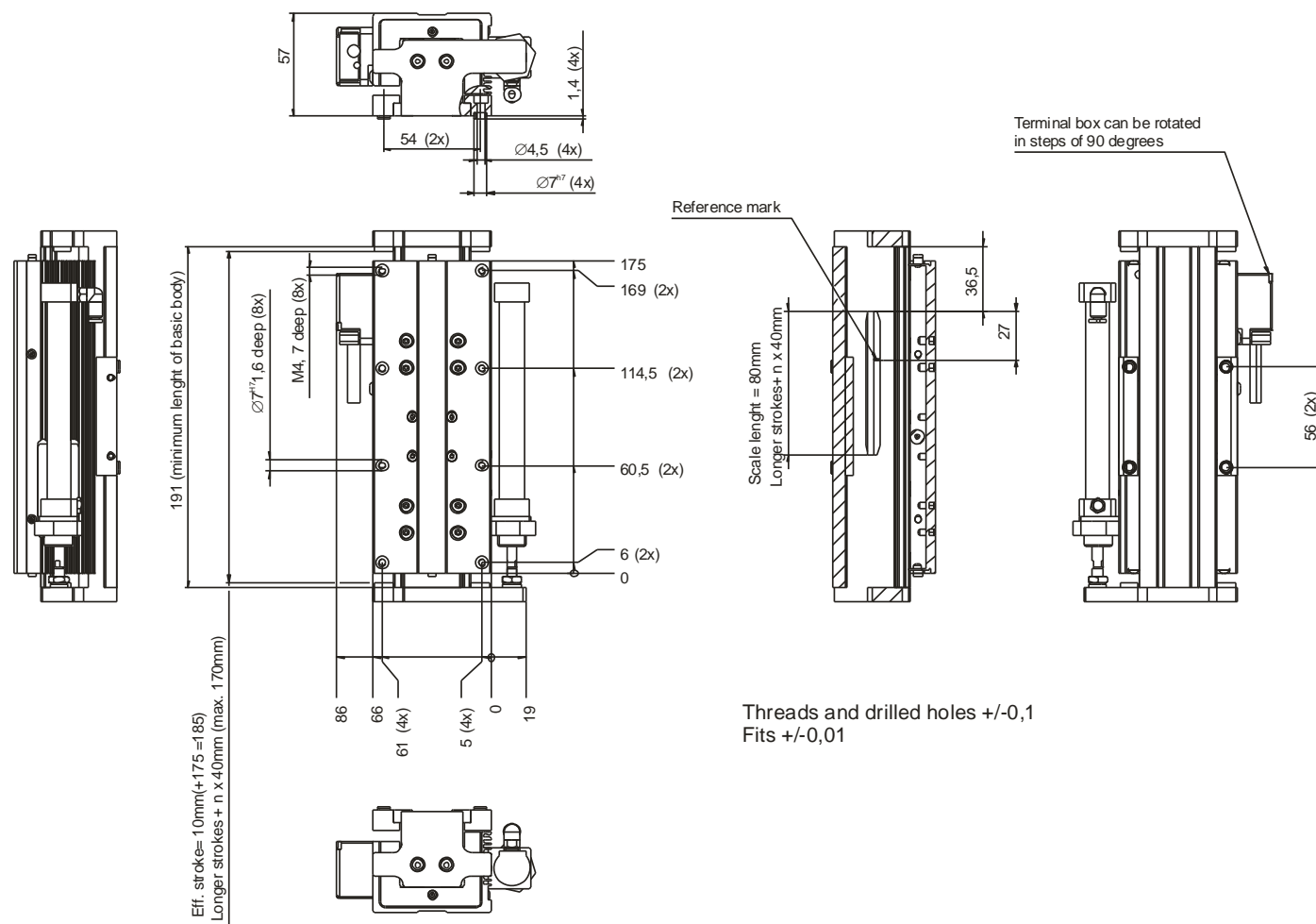


Figure 30: euroLINE 32 KLA Z-axis, Version 5

6.5 Accessory Drawings

6.5.1 Centering Sleeve 1008664

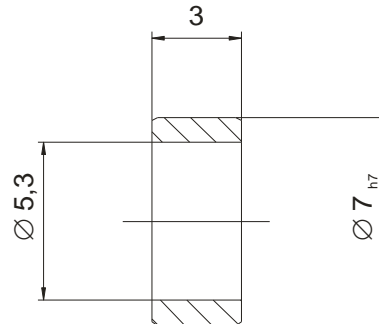


Figure 31: Centering Sleeve

6.5.2 Clamping Element 32 KLA 1068972

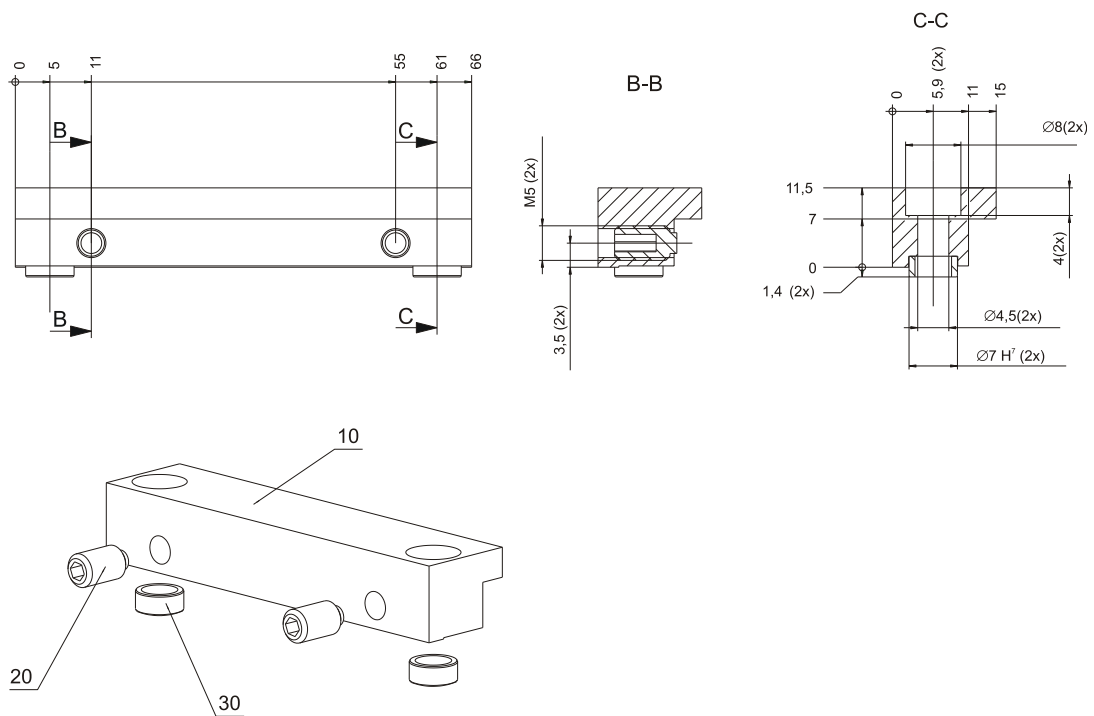


Figure 32: Clamping Element

6.5.3 Mounting Bracket 1071776

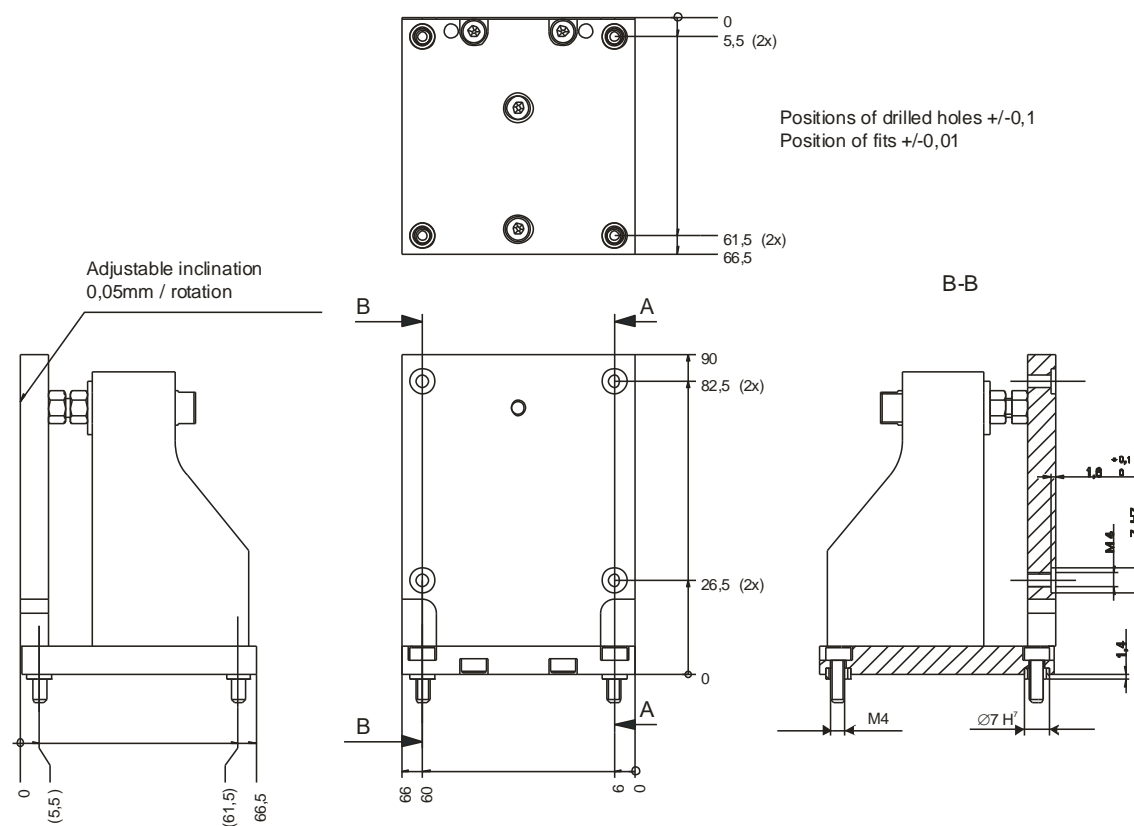


Figure 33: Mounting Bracket

7 Declaration of Incorporation

EC declaration of incorporation in the sense of the EC directive 2006/42/EC (machinery), Annex II B

The manufacturer:

IEF Werner GmbH

Wendelhofstraße 6

78120 Furtwangen - Germany

hereby declares that the following products (the incomplete machine/partial machine):

Designation	IEF Werner parts group number
euroLINE 32 KLA	TG1001250
euroLINE 32 KLA, vertical	TG1001255

where possible based on the scope of delivery, correspond to the following basic requirements of the directive on **Machinery (2006/42/EC)**:

- Annex I, item: 1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.4; 1.5.1; 1.7.3;1.7.4;

The incomplete machine also corresponds to the following further directives:

Directive **2004/108/EC** of the council, dated 15 December 2004, for harmonisation of the legal provisions of the member states on electromagnetic compatibility.

Directive **2006/95/EC** of the council, dated 12 December 2006, for harmonisation of the legislation of the member states regarding electrical equipment for use within specified voltage thresholds.

The technical documents were generated according to Annex VII part B and may be electronically submitted to the national authorities upon justified request.

List of some applied harmonised standards:

EN ISO 12100-1,-2 / EN ISO 13857 / EN ISO 13850 / EN 60201-1

Commissioning of the incomplete machine delivered by us is not permitted until it has been determined that the overall system into which the incomplete machine is installed meets the basic safety and health protection requirements according to Annex I of the above EC directive 2006/42/EC.

Name of the documentation officer: Frank Reichelt, technical editor

Address of the documentation officer: see manufacturer's address

Furtwangen, 07 February 2010



Manfred Bär (manager)